

Agile, interoperable battlefield communications

Soldier Modernisation talks to Harri Romppainen from Bittium about their innovative frontline data and voice communication products

Q: Can you tell us more about Bittium as a company and its history within military communications?

A: Bittium (formerly Elektrobit) was founded in 1985 and our past and present are strongly connected to radio technologies, both in the commercial and military worlds. Our work with military communications began early on with research projects and programmes carried out in co-operation with the Finnish Defence Forces. The Finnish Defence Forces saw then that the nature of the battlespace was going to change in the future and the existing communication systems would not meet the requirements. Software Defined Radio (SDR) was seen as the perfect platform for the future battlefield radio systems and networks. It could offer, among other things, efficiency for wireless communications in network centric warfare and also interoperability nationally and internationally. This led to the start of the Finnish Software Radio Program (FSRP), which Bittium joined. It started as a research program and was followed by the Bittium-led consortium building an SDR demonstrator and a prototype. The demonstrator back then was a cupboard-size rack of computers that now feels like the distant past already.

We have come a long way since the days of the Finnish SDR programme. After a lot of research and technology demonstrations, the Finnish Defence Forces procured a software defined radio based system Bittium Tactical Wireless IP Network, or TAC WIN in short, that is now being used by all three branches of the Finnish Defence Forces, among others. We have accompanied our SDR offering also with our next-generation of tactical Tough SDR radios, handheld radio for dismounted soldiers being one of them. In addition to our software defined radios and systems, we supply different defence forces across the globe with our advanced VoIP solutions. The latest addition is the versatile terminal and IP communication device Bittium Tough Comnode. We can proudly say that what we have achieved so far is a success story based especially on versatile technological expertise and understanding, visionary ideas, co-development with the end users and long-lasting partnerships.



Co-development with the end-user has been one of the success factors with Bittium's equipments and systems for tactical communications (Image: Bittium)

Q: Soldier Modernisation has been looking at the 'Digital Battlefield' and we are now in a situation that, from front line units through artillery to command center, the need for secure data transport is becoming critical. What were the major problems that Bittium encountered that your products are there to solve?

A: The key for us is to meet the requirements of the modern battlefield where a lower number of troops are dispersed and mobile in order to be quick and effective. This scenario is enabled with equipment and systems that deliver more advanced, real-time and accurate situational awareness and enable leading the troops on-the-move.

By working also with commercial telecommunication and mobile technologies, we have seen how those technologies continue to advance at a faster pace compared to military communications. We want to narrow the gap so that militaries have access to a higher level of performance in their networking and communications. This has been done by hardening the most powerful commercial technologies and integrating those into our military products and systems.

In addition, we see that a large number of different equipment and systems from various vendors can create interoperability problems. We provide solutions that are interoperable with our own, 3rd party, as well as legacy

equipment and systems. And last but not least, reliability and ease of use are crucial factors when it comes to operating in the front line.

Q: Bittium Tough SDR Handheld and Bittium Tough Comnode IP communication devices are designed for the modern warfighter and the complex vest systems that they use, as well as being interoperable and multi-frequency. Could you elaborate on the products and their unique features?

A: Bittium Tough SDR Handheld is a next-generation software defined tactical radio for dismounted soldiers, such as squad or platoon leader. With the radio it is possible to bring broadband data and voice to mobile troops in a way that improves the performance and the effectiveness of the tactical troops, and leading the troops is easier based on the up-to-date situational awareness and more reliable connections. The radio has many unique features. Its wide frequency range, from 30 MHz to 2500 MHz without gaps, enables frequency agility and less interference. The radio has a secure sandbox e.g. for tactical VoIP service, messaging, BMS and blue force tracking applications, and a software development kit for 3rd party developers. For our customers we give access to the radio's security implementation for enabling its certification.



The Tough SDR radios have a wide range of frequencies that enables frequency agility and less interference (Image: Bittium)

Bittium Tough Comnode is a versatile and rugged terminal and IP communication device designed for different tactical use cases. The same device fulfils the data transfer and communication needs for mobile troops for example, as a SIP phone, router and SHDSL modem. Bittium Tough VoIP Service can be run on the device to provide telephony and SIP server functionalities to other VoIP devices for accessing the VoIP network. The Tough Comnode also provides a wireless access point for mobile clients and enables using legacy Combat Net Radios as part of the IP-based tactical communication system.

In addition to customers worldwide, the Finnish Defence Forces are supplied with both the Tough SDR radios and Tough Comnode devices.



The Tough Comnode device fulfils the data transfer and communication needs for mobile troops for example as a SIP phone, router and SHDSL modem. (Image: Bittium)

For all of our products we of course provide accessories that enhance the ease of use and mobility of soldiers. A recent addition to that category is the Bittium Tactical Power Pack that can be used with the Handheld radio and Comnode device, as well as commercial smartphones and tablets through USB connection. The Tactical Power Pack enables uninterrupted field use for all the devices. It includes two 70 Wh, 6.7 Ah batteries that are attached as one with an adapter. In the field, the batteries can be changed quickly to new fully charged batteries one by one without interrupting the power supply to the device being charged. The Tactical Power Pack's small size and lightness of weight makes it easy to attach to soldiers other gear, along with the device being charged.

Q: In addition to the hardware, what is the importance of software and back-end systems in your solutions?

A: With Tough SDR radios the waveforms are of course critical elements for secure networking. The radios are compatible with Bittium's proprietary waveforms, the ESSOR (European Secure Software Defined Radio) waveform and they also support porting of legacy and national proprietary waveforms. For secure, easy and effective installation and management of the radios, prior and during operation, we provide a tactical device management system.

For voice communications, our Bittium Tough VoIP Service (TVS) software is an excellent solution, especially for mobile troops. TVS is designed and optimized for military use cases by creating a highly resilient, distributed digital voice service and enabling mobility by adapting to changes in the network. The network can be split or merged while maintaining the service available for all clients that are accessible. When network islands merge with the network, the clients will have core network connection automatically. TVS provides optimized call features, such as managed group calls, PTT calls, call prioritization (MLPP) and user mobility, and enables voice communication between VoIP and CNR networks. ■

For more information, please visit: www.bittium.com